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ABSTRACT

Reported were the development and testing of a therapy program for stutterers which aimed at involving parents in the treatment process. The experimental therapy program was developed and applied to a group of 13 parent child dyads whose interaction patterns were analyzed in an attempt to identify factors pertinent to the child's stuttering. Therapeutic strategies were developed on the basis of observed parent maintenance of stuttering behaviors. Children were found to generalize their increased fluency, acquired with a therapist, to their respective parents. Positive changes in parental verbal behavior were observed. The feasibility of employing the therapy program in a school setting was tested with 13 children. The program was found to be successful in managing stuttering and feasible from the viewpoint of school administrators. Categorization of parent child interactions into 35 thematic content categories was thought to provide crucial information relating to possible maintenance factors of stuttering. It was found that parents of stutterers consistently yielded more negative profiles on the basis of the categories than did parents of nonstutterers. (Author/GW)

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EXPERIMENTAL THERAPY FOR SCHOOL-AGE CHILDREN AND THEIR PARENTS

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June 30, 1971

U.S. DEPARTMENT OF
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TABLE OF CONTENTS

	Page
LIST OF TABLES	i
ACKNOWLEDGEMENTS	ii
SUMMARY	iii
INTRODUCTION	1
A. The Problem: Stuttering in Children	1
B. The Nature of Stuttering in Children	1
C. Management of Stuttering in the Schools	1
D. Purpose of this Project	2
METHODS	3
A. Overview	3
B. Stage I	3
1. Subjects	3
2. Setting	3
3. Speech Evaluation	3
4. Experimental Therapy Program	8
5. General Procedures	9
6. Results of the Initial Application of the Experimental Therapy Program	9
7. Conclusions at the End of Stage I of this Project	17
C. Stage II	19
1. Subjects	19
2. Setting	19
3. Speech Evaluations	19
4. Therapy	19
RESULTS	24
A. Stage I	24
B. Stage II	24
COROLLARY STUDY	28
CONCLUSIONS	32
A. Overview	32
B. Specific Conclusions	32
C. General Conclusions	33
APPENDICES	34
REFERENCES	66

LIST OF TABLES

Page

TABLE 1 5
Results of speech evaluation session for subjects seen in Stage I.

TABLE 2 6
Hypothesized factors that maintain stuttering and derived therapeutic strategies for thirteen parent-child dyads seen in Stage I of this project.

TABLE 3 10
Experimental therapy program.

TABLE 4 13
Parents' observations after viewing their children on videotapes representing two step of therapy (2 and 3) and in two situations (CWS and TS).

TABLE 5 18
Degree of change (expressed in standard-score units) in stuttering frequency from beginning to end of therapy for the subjects in Stage I of this project.

TABLE 6 20
Results of speech evaluation session for subjects seen in Stage II.

TABLE 7 21
Hypothesized factors that maintain stuttering and derived therapeutic strategies for thirteen parent-child dyads seen in Stage II of this project.

TABLE 8 25
Degree of change (expressed in standard-score units) in stuttering frequency from beginning to end of therapy for the subjects in Stage II of this project.

TABLE 9 29
Positive thematic language categories.

TABLE 10 31
Negative thematic language categories.

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SUMMARY

The purpose of this project was to develop a method for treating the child who stutters. Since it is recognized by most authorities in the field of stuttering that parents play a significant role in the acquisition and maintenance of stuttering, a specific goal of this project was to involve the parents in the treatment process.

The project was conducted in two stages. Stage I was a period of therapy-program development and initial application in the laboratory. Stage II dealt with the testing of the therapy program in a primary school setting.

In Stage I, the experimental therapy program was developed and applied to a group of 13 parent-child dyads. The basic features of the therapy program were as follows. Parent-child interaction patterns were analyzed in an attempt to identify possible factors maintaining the child's stuttering. These hypothesized maintaining factors were in turn used in deriving therapeutic strategies. Parents were observed interacting with their children throughout the course of therapy. This continued observation provided additional information about the verbal interaction patterns between the parents and their children. Moreover, it gave a running account of the extent to which increased fluency levels acquired in therapy generalized to the parent. When the child acquired increased and sustained fluency levels with the therapist, the parent was introduced into the therapy situation. In doing this, it was hypothesized that two processes would be operating. First, the child's fluency, acquired with the therapist, would more readily generalize to the parent when the therapist was physically present. Second, the therapist would serve as a vicarious speaking model for the parent. Results of the initial application were favorable as children showed increased fluency levels with both the therapist and their respective parents. In addition, positive changes in parental verbal behavior were observed.

In Stage II, the efficacy of employing the therapy program in a school setting was tested. Thirteen children in 7 primary schools were seen for therapy utilizing the developed program. Again therapeutic strategies were derived from the hypothesized maintenance factors of stuttering identified by observing each parent-child dyad. Results again were favorable in that the majority of children showed increased fluency levels. Although it was more difficult to arrange to have parents come to each therapy session in the schools, attendance during the evaluation session permitted an assessment of parent-child interaction, and attendance periodically thereafter, yielded an estimate of the extent to which therapeutic results generalized. In one case where neither parent was available, a peer was used as a third party therapy

participant with resultant success. The conclusions at the end of Stage II were that (a) the program can be employed in the primary schools from an administrative standpoint, and (b) the program is successful in the management of stuttering.

During the course of this project, it became increasingly evident that observation of parent-child dyads yielded crucial information relating to the possible maintenance factors of stuttering. These factors in turn suggested therapeutic strategies. In this project, the assessment of parent-child interaction was based primarily on clinical judgement. Because of the importance of the interaction data, a more systematic method for collecting it was developed. In utilizing the method, one categorizes each parental statement into one of 35 thematic-content categories: 17 positive and 18 negative. A quantitative profile of the parent's behavior in the presence of his child is obtained. In applying this interaction analysis to parents of stutterers and nonstutterers, it was found that parents of stutterers consistently yielded more negative profiles than did parents of nonstutterers. The application of this interaction analysis validated the basic underlying assumption upon which the therapy described in this project was based.

I. INTRODUCTION

A. The Problem: Stuttering in Children

According to every study made by the U.S. Office of Education since 1931, speech handicapped children comprise the largest group of exceptional children within the total population of school-age children. Johnson (1967) reports their number has been conservatively estimated at 2,225,000, of which approximately 411,600 children present the speech problem known as stuttering.

B. The Nature of Stuttering in Children

It is recognized by most theorists in the field of stuttering, that the parents play a significant role in the acquisition and maintenance of stuttering. This role first became prominent when Wendell Johnson postulated his "semantogenic" theory of stuttering. Since then, Johnson (1967) and many others, Luper and Mulder (1965), Van Riper (1963), Robinson (1964), have cautioned parents against immediately labelling emergent dysfluencies in a child as stuttering. It is suggested that the label somehow acts to alter the parents' behavior toward the child and the child's reaction to his dysfluency, with the result that the dysfluency can develop into established patterns of stuttering. The importance of parental influence and environmental situations is further stressed by Glasner (1960), Wyatt and Heryan (1962), Freund (1966), and Henja (1960). Brutten and Shoemaker (1967) state that stuttering evoking stimuli in a child's environment are the "behaviors" of the adult figures in his life, mainly his parents.

Since theorists have assumed that parental behavior is related to the acquisition and maintenance of a child's stuttering, therapists in turn, have utilized counselling techniques with parents in an attempt to get the parents to handle their child's stuttering and their own reactions to that stuttering differently. Emphasis in parent counselling has ranged from recommendations that the parent participate with the child (Glasner, 1962), to parent counselling in the absence of the child (Bloodstein, 1958).

C. Management of Stuttering in the Schools

Traditionally, public school therapy for the child who stutters has dealt directly with the child, attempting to teach him ways in which to control his speech. The public school clinician who works with the child is frequently limited by time and a large caseload, and, as a result, must involve the child who stutters in a program of group therapy involving a small group of school-age children.

Such a treatment program ignores much of what we know about the problem of stuttering, that is, the contributing effects of the outside environment, particularly the behavior of the parents. It seems that our knowledge of the possible precipitating and maintaining factors of stuttering is to be restricted and used exclusively by clinicians in clinics and non-school environments, or is to be used exclusively in treating the preschool child. There seems to be a tacit assumption that parental influence precipitously diminishes when the child enters first grade.

Since traditional public school therapy ignores, unwittingly perhaps, much of what we know about stuttering in children, it is not surprising to find in the schools many children sitting year after year in therapy, leading at least one author, Sheehan (1970) to suggest that public school therapy serves not to ameliorate stuttering but to enhance and maintain it. Although Sheehan's view is rather singular for both its extremeness and its content, it does, nevertheless, serve as an anchor point from which to critically evaluate public school therapy.

D. Purpose of this Project

It was the purpose of this project to design a therapy program having three basic characteristics: first, it would acknowledge much of what we know about stuttering, namely, that stuttering in the child is a problem intimately intertwined with the child's immediate environment, particularly his parents; second, the program had to be one that was feasible to administer and conduct in the public school setting; and third, the program had to be effective in reducing stuttering in a reasonable period of time.

II. METHODS

A. Overview

This project was designed to be conducted in two stages. In Stage I, the development and initial application of the therapeutic program was executed. In Stage II, the efficacy of using the tested program in the public school setting was investigated.

B. Stage I

1. Subjects

Subjects for Stage I were 13 school-age children and their parents. Subjects were recruited by placing an announcement of the project in the local newspaper. Parents were informed of the experimental nature of the research prior to any evaluation sessions. Both parents and children were aware that sessions (both evaluative and therapeutic) were to be video and/or audio taped. Parents were advised to consult with the speech clinicians in their respective schools about their interest in having their children enter the experimental program. This was done to prevent any suspicion of caseload "raiding", and to prevent any implication that the school clinicians' competence was being questioned. The investigators, moreover, offered to explain any aspect of the research to the respective school clinicians, who for the most part, were enthused about the project and encouraged that some effort, through this research, was being made to directly assist them.

2. Setting

The setting for Stage I was the Speech and Hearing Center, University of Pittsburgh.

3. Speech Evaluation

The basic thesis underlying this project was that stuttering is a learned behavior. In the case of the young child who stutters, stuttering is one of the behaviors he has learned in order to adjust to his environment. Since the child's environment consists mainly of the parents, the parents would predictably be intimately involved in the acquisition and maintenance of stuttering.

The implications of this thesis were reflected in the evaluation procedures designed for this project. If, indeed, stuttering in the young child is acquired and maintained by virtue of certain parent-child interactions, the clues as to what maintains the child's stuttering as well as clues for remediation, might be observed in the parent-child dyad.

Consequently, the evaluation session in this project consisted of two sections: first, the parent and child were placed in a room and asked to talk; specifically, to have a conversation. This conversation was recorded and analyzed. Next, the therapist saw the child. The parent-child session was labelled the controlled-waiting room situation, or CWS; the therapist-child situation was labelled the therapy situation, or TS.

Results from the speech evaluations for Stage I of this project are contained in Tables 1 and 2. Contained in Table 1 is certain identifying information about the parent-child dyads as well as the respective frequencies of stuttering in the TS and CWS. An inspection of the table reveals that all children stuttered in varying degrees.

Table 2 contains the results of the analysis of the parent-child interaction patterns. Interaction was assessed by playing the video recording of the evaluation session to three members of the research staff. Each member was instructed to describe the interactions that he saw, and to make particular notation of those factors that seemed to maintain stuttering. Those impressions that were common in the descriptions of the three judges were abstracted and recorded in Table 2.

An inspection of Table 2 reveals that parent-child interactions seemed less than ideal, particularly in regard to Dayds 2 through 13. In Dyads 2 through 13, the parents displayed an apparent lack of respect for their children. Common to these dyads were many conversational characteristics, such as interruptions, sarcasm, and belittling that seemed inimical to good conversation. Dyad 9 seemed unique. The mother in this dyad was singularly different. She accepted her son and his speech regardless of its thematic content or manner of utterance.

With the commonalities noted in the parent-child interaction patterns it was not surprising, therefore, that commonalities should exist in the derived therapeutic strategies (see Table 2). In most cases, particularly Dyads 2 through 13, the derived therapeutic strategies were simple and straightforward, straying very little from common-parlance ideas or language. Most often were the recommendations that the child be encouraged and praised for coming to therapy; that the therapist should give the appearance of being glad that he came and that he looked forward to seeing him; that verbal output should be reinforced; that the child's ideas, thoughts, and feelings should be respected; and that the therapist should express interest in whatever the child had to say. Only in the case of Dyad 9 did the derived strategy depart significantly from this general pattern.

TABLE 1. Results of speech evaluation session for subjects seen in Stage I.

SUBJECT NO.	AGE	SEX OF CHILD	SEX OF PARENT	% OF WORDS STUTTERED CWS*	TS**
1	13	M	F	14.29	23.79
2	6	M	F	4.72	8.26
3	8	M	F	2.62	2.47
4	13	M	F	12.98	12.76
5	9	M	F	5.34	6.80
6	11	M	F	3.74	4.51
7	7	M	M	12.00	5.12
8	5	M	F	3.81	4.33
9	13	F	M	2.09	1.88
10	10	M	F	.95	2.35
11	13	M	M	20.69	16.72
13	12	M	M	7.74	11.02
14	11	M	F	6.23	3.84

*CWS refers to controlled waiting room situation
**TS refers to therapy situation

TABLE 2. Hypothesized factors that maintain stuttering and derived therapeutic strategies for thirteen parent-child dyads seen in Stage I of this project.

PARENT-CHILD DYAD	HYPOTHESIZED MAINTAINING FACTORS	DERIVED THERAPEUTIC STRATEGIES
1	Mother's complete acceptance of stuttering.	Do not accept stuttering. Force a change in speaking behavior.
2	Mother did not listen to child. Child was always a fantasy character (Superman).	Use puppets to force child to learn social interaction and experience fluent speech.
3	Mother showed verbal aggression. Child showed no spontaneous speech.	Reinforce spontaneous verbal output. Show interest in what the child has to say.
4	Lengthy silent periods. No one talked. Verbal aggression on part of mother.	Reinforce verbal output. Give opportunity for success and praise it.
5	Mother interrupted constantly.	Do not interrupt child. Reinforce verbal output and show interest in what the child has to say.
6	Both parent and child verbally aggressive. Long periods of silence.	Reinforce verbal output that is non-aggressive.
7	Long periods of silence. Parent asked questions--child gave brief answers.	Give acceptance for ideas and reinforce verbal output.

TABLE 2 (con't)

PARENT-CHILD DYAD	HYPOTHESIZED MAINTAINING FACTORS	DERIVED THERAPEUTIC STRATEGIES
8	Mother degraded child, was verbally aggressive and silent.	Give praise for coming to therapy, and be interested in what child has to say.
9	Father reacted to mild stuttering and aversive topics (e.g. short skirts) by holding his hands over his ears.	Work on attitude, word, and situation fears. Listen to what the child has to say.
10	Mother interrupted constantly. Mother continually asked questions which she in turn answered. Child whined in response.	Give child opportunity to talk. Praise him for his ideas and thoughts. Do not accept immature whining type responses.
11	Father continually interrupted, was sarcastic and belittling. Father made abrupt changes in conversation such as why a chore was not done last week. Child huddles in silence.	Reinforce verbal output. Do not interrupt. Listen and be interested to what the child has to say.
13	Father unable to engage child in conversation. Child said "no" to each attempt. Much silence.	Reinforce verbal output. Attempt to initiate conversation.
14	Mother's conversation directed to how child will appear to other adults. Mother gave a collage of suggestions about the merits of good grades, etc. Child submits with agreement.	Listen to what child has to say. Encourage him to talk about his feelings and the reasons underlying his behavior.

It was of some surprise to the investigators that the nature of the parent-child interactions appeared to be so obviously negative in the majority of cases. It was anticipated that the possible maintenance factors of stuttering would be more subtle and elusive. It, of course, was possible that they were, and that what was being observed was indeed obvious, but not necessarily valid. Nevertheless, the fact remained that most dyadic interactions were characterized by parental verbal behavior that seemed to lead to hostility, aggression, silence, and withdrawal from the speaking situation by the child. It was hypothesized in turn that these behaviors were responsible for the maintenance of stuttering.

4. Experimental Therapy Program

It was the proposed intent of this research to develop a therapeutic strategy that would combine the principles of family therapy and operant conditioning. Specifically, it was proposed that the therapist would utilize operant conditioning techniques in an attempt to reduce the frequency of the child's stuttering. The parent was to observe and learn the therapist's techniques in training sessions with the therapist. Video tapes of past therapy sessions were to be employed in the training sessions. The parent was to then apply the techniques directly in the presence of his child and the therapist, and subsequently, in the presence of the child but in the absence of the therapist. However, after viewing the parent-child interactions as represented in Table 2, it became apparent that certain modifications were in order. The parent-child sessions seemed to suggest that the negative interpersonal behaviors exhibited by the parents obviated a procedure that taught them a technique to use in reacting to their children's stuttering. The value of the technique would predictably be overshadowed by the negative interpersonal climate and presumably be reduced in its capacity for effectiveness. Therefore, certain modifications in the original proposed strategies were made. The modifications will be reflected in the experimental therapy program presented below.

The experimental therapy program developed was based on the aforementioned thesis of the project; namely, that stuttering in children is intimately related to their environment, particularly their parents. If a child's stuttering is maintained in large part by the environment of parental behavior, then the therapist's task would seem to be to create a new environment in order to permit the desired response, comfortable fluency, to emerge. To create this new environment, the therapist was instructed to follow the therapeutic strategies listed in Table 2, providing almost mirror-image interpersonal behaviors in comparison to the parent. It was recognized too, that to assist the child in becoming fluent in therapy, while at the same time

ignoring the behavior of the parent, particularly in light of the information in Table 2, would be inconsistent with the thesis of this project. Therefore, plans for bringing about changes in the parents' behavior were included in the experimental therapy program. These were the general considerations in the development of the program. Contained in Table 3, is a step-by-step description of the experimental therapy program. Rationales for each step are given.

5. General Procedures

All situations in which the child talked were audio and/or video recorded. The recordings were analyzed and two measures per recording were extracted. The measures were the number of words uttered by the child, and the number of times he stuttered. A stuttering percentage was then calculated by dividing the former measure into the latter and multiplying the quotient by 100.

The reliability of observer judgement on the above measures was assessed in the following manner. Twenty 5-minute speech segments representing 5 subjects in various stages of therapy and in the two situations (CWS and TS) were analyzed. Counts and ratings of the 20 samples were made by two therapists, as was a second count and rating by one therapist. Pearson-product moments were calculated among the distributions, yielding respective intra and inter-judge correlations of 0.95 and 0.89 on the stuttering percentages.

6. Results of the Initial Application of the Experimental Therapy Program

Since the application of the experimental therapy program in Stage I of this project was part of the development of that program, the results from the initial application will be presented here in Section II, "Methods". Results from Stage II of the project, where the efficacy of using the program in the primary schools was tested, will appropriately appear in the "Results" section of this report.

The 13 subjects presented above and evaluated for the project were accepted for therapy. Other children were seen but were not accepted for various reasons such as not being diagnosed as a stutterer, not having a parent able or willing to accompany them to therapy (in such cases, appropriate referrals were made), presenting problems more salient or critical than stuttering (again appropriate referrals were made), and for other miscellaneous reasons.

The raw data for the subjects seen in Stage I is contained in Appendices 1 through 13. It can be seen from these Appendices that 6 of the 13 subjects reached Step 4 of the program, meaning, of course, that they reached the criteria for Step 3.

TABLE 3. Experimental therapy program.

	STEP NO. 1
DESCRIPTION:	Parent is seen alone and is informed about the nature of his or her participation in the project. In this first step, the parent is instructed that he or she will wait with his or her child in a controlled waiting room situation (CWS) for fifteen minutes before each therapy session. This waiting room situation is controlled by virtue of the fact that it is timed, and is video and audio recorded.
RATIONALE:	To inform parent that he or she is a participant in therapy and has certain responsibilities.
	STEP NO. 2
DESCRIPTION:	Therapy sessions begin. Each session is preceded by the CWS described above. In the therapy situation (TS), the therapist arranges the environment (physical and verbal) in order to evoke fluent speech from the child. Therapeutic strategies used in the TS are derived from careful observation of the parent-child interaction patterns in the CWS. Interaction patterns that seem to maintain stuttering in the CWS are avoided in the TS.
RATIONALE:	To create a new "environment" that will facilitate the emergence of comfortably fluent speech.
	STEP NO. 3
DESCRIPTION:	Step 2 is continued until (a) the child's stuttering frequency falls below 1% (stuttering on less than 1% of the words he utters), (b) stuttering severity decreases, and (c) stability is observed in the child's lessened stuttering frequency and severity, so that fluency can exist in the absence of any therapeutic prompts.
RATIONALE:	To permit the newly emergent fluent speech to strengthen and stabilize.
	STEP NO. 4
DESCRIPTION:	When the requirements for Step 3 are satisfied, the parent is shown video tapes of his child at the time of his initial speech evaluation and at the time of his meeting the requirements for Step 3. Segments from both the TS and CWS are shown. The parent is asked to observe the segments and describe orally and in writing, his child in each of the segments.

TABLE 3 (con't)

STEP NO. 4

RATIONALE: The purpose of Step 4 is to demonstrate to the parent that his child is capable of fluency and to provide a vicarious speaking model (the therapist) for the parent.

STEP NO. 5

DESCRIPTION: The parent is now introduced into the TS. The CWS is, however, maintained. In the TS in this step, the therapist, the parent, and the child are together in the room. There are four time segments, each ten minutes in length. The segments are as follows:

Segment	Participants
1	Parent, child, and therapist (child and therapist talking)
2	Parent, child, and therapist (parent and child talking)
3	Same as segment 1
4	Same as segment 2

RATIONALE: To permit the child's fluency to generalize from the therapist to the parent. To provide the parent with a vicarious speaking model in the person of the therapist.

STEP NO. 6

DESCRIPTION: Step 5 is run until the fluency the child demonstrates with the therapist generalizes to the parent. When this fluency appears also in the CWS where the therapist is absent, the child is considered for discharge.

RATIONALE: To permit the newly acquired fluency to generalize to the parent and be maintained in strength.

Five of the 6 parents, whose children reached Step 4 of the program, were asked to observe a video tape session of their children talking to the therapist. The recording chosen to view was one selected from the Stage 3 sessions, wherein the child was speaking in a manner of increased fluency. In addition, three comparison tapes were also shown to the parents. They were (a) CWS and (b) TS tapes recorded at the beginning of therapy, and (c) a CWS tape recorded on the same day as the aforementioned Step 2 TS tape. The parent was asked to view the tapes and to note any particular aspect of his child's behavior of interest. Table 4 shows the results of the parents' observations. It can be seen from the table, that the parents did note changes in both the manner and content of their children's speech, and moreover, observed particular aspects of the therapist's behavior. The observations of therapist behavior were focused primarily on his mode of interacting with the child and less on how the therapist reacted to stuttering blocks. In this regard, the goal of Step 4 was achieved, in that the therapist did seem to serve as a vicarious speaking model for the parent.

The vicarious learning that was apparently evident in Step 4 would seem to recommend the use of this step in therapy. However, another factor arose which led to the abandonment of Step 4. After viewing the tapes, two of the mothers expressed grave concern about themselves as mothers. Observing their children talking more fluently and interacting more favorably to a third person, the therapist, seemed to produce guilt and associated feelings of failure in at least these two parents. It seemed that Step 4 was too abrupt, and that further progress in the child might be jeopardized by upsetting the parent at this stage in the program. For example, parents might criticize their children for being so "good" with the therapist and so "bad" with themselves. Thus, Step 4 was eliminated from the program.

Besides the raw data in Appendices 1 through 13, a further analysis was done to examine the effects of the therapy program from the beginning to end of therapy. In other words, did the child improve when seen on the program? To determine this, grand means and standard deviations were calculated for each subject on CWS and TS stuttering percentages. Thus, for each subject there were two "score" distributions: a CWS distribution and a TS distribution. Each distribution included all the percentages calculated on all the CWS or TS sessions. Next, respective means for the first 1 to 3 sessions and last 1 to 3 sessions were calculated. These beginning and end means were then converted to z-scores by using the grand means and standard deviations. The difference between the beginning and end z-scores shows the resulting change over the course of therapy for each subject.

TABLE 4. Parents' observations after viewing their children on videotapes representing two steps of therapy (2 and 3) and in two situations (CWS and TS).

PARENT NO.	THERAPY STEP	SITUATION	PARENTS REPORT
1	2	CWS	He seems to repeat almost every word. I didn't realize how bad he sounded until I saw the tape. He appears to be wrinkling his nose when he has trouble talking. He appears to throw his head up and to the side and roll his eyes back somewhat when he stutters.
1	2	TS	He still stutterers on almost every word. He seems to be blinking his eyes quite a bit here. The tone or pitch of his voice seems to get higher when he stutters. He wrinkles his nose as above.
1	3	CWS	He still seems to roll his eyes once or twice but not as often as before. The stuttering appears to occur only on certain words instead of all words. He seems more relaxed at this time.
1	3	TS	He seems extremely fluent with no stuttering. No excessive eye movements. He seemed so good talking this time, could it be he has the most difficulty talking with me and his family. I didn't realize how bad he stuttered until I saw the comparison and saw how much he improved over the months. I'm so pleased with his progress and he is also. He feels he is doing so much better too. His dad feels he has progressed remarkedly well also. His grandmother feels he still stutters too much because she thinks his speech should be perfect. She feels when I correct him or his dad corrects him this causes his stuttering, but we feel he needs the correction when necessary. He doesn't like to be corrected but I find this is not any different from other teenagers including his younger sister.

TABLE 4 (con't)

PARENT NO.	THERAPY STEP	SITUATION	PARENTS REPORT
3	2	CWS	John looks nervous, but his speech seems very good. He gets very loud whenever you don't understand what he's saying. He looks very jumpy and nervous to me. He looks like he's trying very hard not to stutter.
3	2	TS	He looks so much more relaxed with you (therapist), but sort of scared, like he's trying to be very polite. His speech is very good, better than when he's with me. He doesn't look a bit nervous or excited.
3	3	CWS	His speech is excellent, hardly any stuttering at all. When you ask him something that excites him, then it starts. As long as he's talking about what he wants to talk about without being asked any questions, he's fine.
3	3	TS	The reading is very good, which surprises me, because in school his reading marks are very poor, and his effort in reading is considered poor by the teachers. He does not stutter at all when reading. I think the encouragement and praise you are giving him is marvelous. It means a lot to him.
5	2	CWS	He blinks his eyes which I don't see him do too often now. He was a little self conscious. Showed he hesitated over the word. He hesitated over the word "Santa Maria". I had noticed he blinked his eyes when he wasn't too sure of what he wanted to say. This is something I don't see him do too often now.
5	2	TS	You got him talking about something he was interested in. He hesitated over "then". He would repeat words as if he wasn't too sure of what he wanted to say. This he doesn't seem to do too much now. He played with his hands a lot as if he was nervous.

TABLE 4 (con't)

PARENT NO.	THERAPY STEP	SITUATION	PARENTS REPORT
5	3	CWS	He looks more relaxed. No eyes blinking, no hesitating.
5	3	TS	I thought he talked a lot better on this tape than the first. No eyes blinking; more relaxed. On the first tape I noticed he did different things that I really didn't know he did. Played with his hands too much and couldn't sit still. I was surprised to see that you had just talked to him about anything as Philip would never say what you two talked about. You talk to him the same way I do. I thought maybe you have mentioned about his hesitating and why he did it.
7	2	CWS	Steven is talking about a racing set he wanted to get for his birthday. He uses his hands a lot to help explain what he wants to get across. He did hesitate a lot in his speech.
7	2	TS	Steven had a little bit of a problem explaining the cord and music to Mr. Johnson (therapist).
7	3	CWS	He has a little problem remembering what he did in school; forgets a lot of details of the story he is relating. His speech has improved. Speaks with less hesitation.
7	3	TS	Looks like he is in a happy relaxed mood. Needs to be encouraged to go into detail in explaining one given subject. Steven is a big help when encouraged. The last tape Steven talked more with less hesitation.
9	2	CWS	Breathy approach not being said anymore. This tape is better than some of the very earlier ones. At this point, she started to improve. She is trying hard, on this tape, not to have any dysfluency.

TABLE 4 (con't)

PARENT NO.	THERAPY STEP	SITUATION	PARENTS REPORT
9	2	TS	She is trying to be more deliberate about her speech in this tape as if she discovered, or learned, a technique for avoiding fluency. She seems to have less dysfluency talking to Mr. Johnson (therapist) than with me.
9	3	CWS	In tape one and three, I find myself not treating her with the proper amount of consideration. Maybe not as much as I would give an outsider. Particularly true of tape one. Denise had very little dysfluency in this tape. Almost completely normal.
9	3	TS	Again Pete Johnson (therapist) seems to be causing less dysfluency in Denise's speech than I do. Pete appears to be more interested in what Denise is saying than I did.

Table 5 lists the z-score changes for the 13 subjects seen in Stage I of this project. In 8 cases there were positive changes (meaning increased fluency) in both the CWS and TS. Seven children had positive z-score changes of one unit or more in the CWS. Nine children had positive changes of one unit or more in the TS, and 4 of the 9 had changes exceeding two units or more. Subject 3 showed negative z-score changes in both the CWS and TS meaning that dysfluency increased. Slight negative values were also seen in the CWS with Subjects 5 and 8.

An inspection of the raw data for Subject 3 (see Appendix 3) shows that Subject 3's fluency levels were lower midway in therapy than either at the beginning or end of therapy. In other words, this child initially showed improvement. One possible influence in this child's failure to show continued improvement was the fact that his parent (mother) was one of the two parents who was disturbed after viewing the tapes in Step 4. After this viewing, the child's stuttering continued to increase with his mother and began to increase with the therapist. With the two other subjects who showed negative z-score changes in the CWS, poor attendance at therapy was noted; this in turn seemed to be the underlying reason for poor progress in therapy.

It is to be noted that 6 of the 13 subjects in Stage I reached Step 4 of the program, and subsequently, moved to Step 5. In Step 5, the parent is introduced into the therapeutic situation (see above). Thus, with Subjects 1, 3, 5, 7, 9, and 10 final session scores for the TS reflect the child's speech in the presence of the therapist and the child's parent. The fact that in 5 of 6 cases z-score changes were positive seems to indicate that the therapist's presence facilitated the generalization of the child's fluency to the parent.

At the end of Stage I, various accomodations and referrals were made for the 13 parent-child dyads. Children 1, 5, 6, 7, and 9 were discharged and asked to return for reevaluations; Dyads 2 and 8 moved from the area. Dyad 3 was seen additionally, and subsequently discharged; Child 10 later became fluent, but had a residual "r" articulation problem and was referred to another remedial program; Child 11 is still receiving therapy; Child 13 and his family were referred to a child guidance clinic for a problem that surfaced during the course of therapy; and Child 14 returned with his parents to a military base in Thailand.

7. Conclusions at the End of Stage I of this Project

The conclusions reached at the end of Stage I of this project were (a) parent-child interaction patterns can reveal

TABLE 5. Degree of change (expressed in standard-score units) in stuttering frequency from beginning to end of therapy for the subjects in Stage I of this project.

SUBJECT NO.	Z-SCORE CHANGE	
	CWS*	TS**
1	.26	2.30
2	.02	2.41
3	-1.69	-.69
4	1.89	2.32
5	-.06	.41
6	1.00	.93
7	1.26	1.95
8	-.56	1.60
9	1.08	1.36
10	.32	.44
11	1.03	2.42
12	1.49	1.77
14	1.94	1.86

*CWS refers to controlled waiting room situation
**TS refers to therapy situation

factors that possibly maintain stuttering, (b) that these same factors can be used in designing a therapeutic program, and (c) that this program, as modified (Step 4 removed), is in large part successful in reducing stuttering in the child and in vicariously training the parent to interact more favorably with his child.

C. Stage II

1. Subjects

Subjects in Stage II were children in the primary school system, Catholic Diocese of Pittsburgh. Seven of the schools in the Diocese were visited and all children suspected of having any speech disorder were evaluated by us. In the 7 schools, 19 stutterers were identified and 13 of these became the subjects for Stage II of this project.

2. Setting

The primary purpose of Stage II was to test the efficacy of the experimental therapy program in a primary school setting. The schools of the Catholic Diocese of Pittsburgh offered such a setting. In addition, the schools in the Diocese were in need of additional speech services so the cooperative arrangement was one that offered the promise of mutual reward. Details of this arrangement are contained in Appendices 28 through 31.

Children and their parents were seen in their respective schools during school hours. In most cases, this was done during periods of lesser academic importance such as gym, study periods, and so on.

3. Speech Evaluations

The children in Stage II were evaluated in the same manner as those in Stage I. Results of the evaluations and additional identifying information is contained in Tables 6 and 7. An inspection of Table 6 shows that the children stuttered in varying degrees in both the TS and CWS. Table 7 shows the hypothesized maintaining factors of stuttering and the derived therapeutic strategies. The information in Table 7 resembles that in Table 2, in that, again, many parental verbal behaviors seemed negative in tone and detrimental to a good parent-child interpersonal relationship.

4. Therapy

Therapy began in the same manner as in Stage I. The therapist reacted in a manner opposite to the manner described in Table 7. If the parent continually interrupted the child, the therapist did not interrupt; if the parent

TABLE 6. Results of speech evaluation session for subjects seen in Stage II.

SUBJECT NO.	AGE	SEX OF CHILD	SEX OF PARENT	% OF WORDS STUTTERED CWS*	TS**
16	10	M	F	2.70	1.66
17	10	M	F	1.95	2.01
18	10	M	F	7.11	8.03
19	9	M	F	3.30	2.07
21	7	M	F	4.72	2.78
22	13	F	F	3.43	4.66
23	11	M	F	3.92	1.87
24	13	M	F	7.69	8.57
25	9	M	F	4.56	5.03
27	6	M	F	16.06	12.33
28	7	M	F	17.31	9.30
29	9	M	F	2.63	5.39
30	9	F	F	1.97	2.10

*CWS refers to controlled waiting room situation
**TS refers to therapy situation

TABLE 7. Hypothesized factors that maintain stuttering and derived therapeutic strategies for thirteen parent-child dyads seen in Stage II of this project.

PARENT-CHILD DYAD	HYPOTHESIZED MAINTAINING FACTORS	DERIVED THERAPEUTIC STRATEGIES
16	Mother demanding and authoritative. Asking questions with little time for answers.	Reinforce initiation of topic. Give opportunity for lengthy utterances.
17	Mother makes curt statements. Does not react to child's answers.	Interest shown in what the child says. Therapist's remarks put into statement form.
18	Parent aggressive and demanding. Stress on superior achievement.	Acceptance of all levels of performance. Evaluation of speech performance.
19	Parent reacted to all non-fluencies and not the content of the child's speech. Child aware of non-fluencies.	Praise for all utterances. No reaction to non-fluencies.
21	Rapid speech by mother and child. Few silent periods.	Therapist slow rate of speech. Silent period before therapist response.
22	Parent accepts stuttering.	Stuttering not accepted. Fluent speech reinforced.
23	Child aware of stuttering. Parent does not react to stuttering.	Reinforce inciteful statements about stuttering. Demand fluent speech.

TABLE 7 (con't)

PARENT-CHILD DYAD	HYPOTHESIZED MAINTAINING FACTORS	DERIVED THERAPEUTIC STRATEGIES
24	Mother passive. Child dominating conversation.	Child placed on a program of mild verbal punishment for stuttering responses.
25	Mother aggressive. Interaction primarily question and answer.	Topics initiated by child reinforced. Therapist encourages child to talk and shows interest in topic.
27	Parent intolerant of child and of therapy situation.	Reinforcement for coming to therapy and for all utterances.
28	Parent aggressive. Dominated conversation giving child little time for response.	Reinforcement for child's utterances and for fluent speech.
29	No parent available in this case. Child was in residence.	Child placed on program of mild punishment for stuttering responses and reinforcement for fluent speech.
30	Parent directed conversation and censored topics discussed.	Child encouraged to speak freely. Reinforcement for fluent speech.

seemed to react only to dysfluency and to ignore content, the therapist listened to content and showed interest in what the child had to say; and so on. In the main, the therapist showed interest in what the child had to say and later commented to the child about how well he was talking after the child showed some stable improvement in the production of fluent speech. There was only one exception to the above strategy: Subject 29. Subject 29 was not living with his parents. The therapeutic strategy used with Subject 29 was as follows: contingent upon each block, the therapist mildly punished the child by repeating the stuttered word; fluent phrases were praised. To test the effects of generalization, one of Subject 29's peers was brought into the CWS. The results below will show that this strategy was generally effective.

III. RESULTS

A. Stage I

Since the purpose of Stage I was to design and initially apply an experimental therapy program to be used in Stage II, the results of Stage I have been presented above in the "Methods" section of this report.

B. Stage II

The raw data for the 13 subjects seen in Stage II of this project is contained in Appendices 14 through 26. An inspection of these Appendices shows an extensive number of zeros for the CWS sessions. This means that Stage II parents were less able to attend therapy sessions than were Stage I parents. The most likely reason for this was that arrangements were made to see parents in the evening in Stage I. Thus, many common problems such as babysitting, availability of transportation, and not being at work were solved with the evening appointments. Nevertheless, those sessions that the parents did attend were valuable in getting the information required by the program. First, attendance during the speech evaluation session made available the parent-child interaction information which was used to derive therapeutic strategies. Second, their attendance thereafter, except in cases 17, 19, and 24, permitted some assessment of the generalization of therapeutic results. However, because parents could not attend regularly, Steps 5 and 6 of the program could not be conducted.

The raw data for Stage II subjects was analyzed in the same manner as that in Stage I, that is, by converting stuttering percentages to z-scores and then noting the amount of change, in z-score units, from the beginning of therapy to the end of therapy. Table 8 lists the z-score changes for the subjects in Stage II in both the CWS and TS. Since the beginning session scores and final session scores were derived by averaging the first 1 to 3 sessions and the last 1 to 3 sessions, the z-score comparison was possible only if there were beginning and end sessions. In 3 cases in the CWS, z-score comparisons were not possible due to the parents failure to attend regularly. These are noted on the table.

An inspection of Table 8 reveals that 10 subjects had positive z-score changes of one unit or more, and 7 had positive changes of two units or more. In the TS, 11 subjects had positive z-score changes of one unit or more, 7 had changes of two units or more, and 1 had a change exceeding three units. No subject, in either the CWS or TS, exhibited a negative z-score change, that is, no subject's stuttering increased. Because z-score changes for all subjects were positive in both the TS and CWS, it can be

TABLE 8. Degree of change (expressed in standard-socre units) in stuttering frequency from beginning to end of therapy for the subjects in Stage II of this project.

SUBJECT NO.	Z-SCORE CHANGE CWS*	TS**
16	2.16	2.86
17	NC***	.97
18	2.11	2.68
19	NC	3.28
21	2.23	2.75
22	1.81	1.49
23	2.70	2.00
24	NC	2.56
25	1.57	1.76
27	1.58	1.67
28	2.02	1.85
29	2.11	2.18
30	2.25	.28

*CWS refers to controlled waiting room situation
**TS refers to therapy situation
***NC refers to Z-score not calculated

concluded that increased fluency levels emerged, and that this increased fluency generalized outside of therapy, namely, to the CWS.

A comparison of Table 8 with Table 5, or a comparison of Stage I data with Stage II data, shows the results in Stage II of this project superior to those in Stage I. The number of positive z-score changes above one, two, and three units in the TS was greater in Stage II as well as the number of z-score changes above one unit in the CWS. In addition, the average number of sessions per subject in Stage II was 14.8 compared with 21.2 sessions in Stage I. In sum, the 13 subjects in Stage II showed greater fluency gains in both the CWS and TS than did subjects in Stage I, and they achieved these gains in a shorter amount of time.

There are several possible reasons for the better results in Stage II than in Stage I. One is that in Stage II a therapeutic strategy was being used after prior testing so that, in general, things went more smoothly because of previous experience with the program. A second reason is that Stage I children had previously been seen in public school therapy and had not achieved fluency, indicating, possibly, that their stuttering patterns were more resistant to change. The children seen in Stage II had no regular therapy in the schools previous to our intervention. Thus, a more representative sample of school-age stutterers was obtained. A final possible reason for the difference between Stage I and Stage II data was that parents attended all sessions in Stage I and only some of the sessions in Stage II. The data presented above would seem to indicate that having the parent attend the evaluation session is crucial in determining parent-child interaction patterns and in planning therapeutic strategies, and that parental attendance periodically thereafter is important in determing the extent to which fluency is generalizing. At the same time, however, it may not be crucial for the parent to attend every therapy session. Perhaps the child needs some time to be working on his own, to feel independent and free to attempt new ways of talking in the absence of parental surveillance.

The above discussion suggests at least three possible reasons for the superior performance of subjects in Stage II. However, no singular conclusive reason can be stated. What is indicated by the data from this study is that parents need not attend all therapy sessions in order for therapy to be successful, giving our program a degree of flexibility needed in a program for the public schools. The program requires the parents' involvement, but not on the same rigid schedule as previously thought necessary.

Stage II results suggest that the experimental program designed in Stage I of this project is efficacious for use

in a public school-type setting. With only slight modifications, (as noted above) use of the program, which employs parent-child interaction patterns in the derivation of therapy, can lead to reductions in stuttering in school-age stuttering children.

Children in Stage II were seen for one school year. Because each child displayed fluency gains in varying degrees, the children were given tentative discharges at the end of the school term. They will be reevaluated at the beginning of the next school term in September, 1971.

IV. COROLLARY STUDY

During the course of this study, it became evident that parental behaviors associated with the possible maintenance of the child's stuttering seemed more critical than previously thought. It was not certain whether the parental behaviors observed in this study were typical or atypical.

To determine this, 14 parents of stuttering children (13 of whom were parents of Stage I subjects) were compared with 14 control parents. Control was achieved by matching parents in regard to sex and in regard to the sex and age of their children. Each parent talked to his child for 15 minutes. The parent-child dyads were instructed, "just to talk--to have a conversation". The conversations were recorded on audio tapes and analyzed by a technique developed on this project.

The method developed for analyzing the verbal behavior of the parent in the presence of his child was based, in part, on the ideas of Haim Ginott as presented in his book, Between Parent and Child (1969), and in part upon the clinical experience of the investigators. The method yields a quantitative profile of the parents' verbal behavior when talking to his child and shows the distribution of the parent's statements across 35 thematic language categories, 17 positive and 18 negative. Generally, a positive statement is one that encourages mutual respect between parent and child, encourages verbal output on the part of the child, and indicates acceptance of the child's feelings and ideas. A negative statement is one that fosters hostility, distrust, aggression, or silence. The categories and their specific definitions are shown in Tables 9 and 10. In addition, a score sheet for recording the data is contained in Appendix 27.

Using this method, it was found that (a) a significantly greater number of positive statements were uttered by control parents than by parents of stutterers, and (b) that a significantly greater number of positive statements were uttered by parents of stutterers at the end of their children's therapy than at the beginning.

Thus, the corollary study seems to support, in a more quantitative way, the basic assumptions of this project.

TABLE 9. Positive thematic language categories.

1. Positive Questions: positive questions are those which encourage vocalization; e.g., "What did you do in school today."

2. Positive Advice: advice which is preceded by understanding; e.g., "If you are well rested you are stronger. That's why you should go to bed early."

3. Positive Praise: praise aimed at the child's actions or deeds instead of his personality; e.g., "You did a fine job washing the car."

4. Positive Comparison: a comparison that indicates understanding; e.g., "Sometimes even I am afraid of the dark."

5. Event-Feeling: a statement which takes into account the feeling of the child when he relates an event; e.g., if the child says that the teacher yelled at him in school, a good event-feeling statement would be, "I guess you were quite embarrassed."

6. Sequitur: any statement which follows content-wise the direction of the child's conversation.

7. Positive Criticism: criticism which is preceded by understanding; e.g., "I know you are restless but you can't pull the curtain in the clinic."

8. Verbal Lubricant: any utterance which demonstrates attentiveness and interest on the part of the listener; e.g., "Thats interesting--tell me more."

9. Mirrors-Personality: a statement which reflects the child's apparent feelings, e.g., "I see you are angry now."

10. Permits Ambivalence: a statement which shows acceptance of bipolar feelings; e.g., "Sometimes you just don't like your brother."

11. Identifies Reasons for Emotions: a statement which helps the child localize the focus of his emotions; e.g., "It looks like you might be kicking things around because your brother got a letter today and you didn't."

12. Understands Feelings: a statement which helps the child accept a feeling; e.g., "I know you would like to receive a letter too."

13. Humor: common laughter without any trace of sarcasm.

TABLE 9 (con't)

14. Qualifying: statements preceded by "If, I think, I guess".

15. Information: any statement which presents new information; e.g., "While you were at school, grandma called".

16. Parent's Thoughts and Feelings: any statement that shows the parent identifying his thoughts and feelings and the reasons for them.

17. Other: a residual category made available to place any positive statement that does not fit easily into any of the above positive categories.

TABLE 10. Negative thematic language categories.

1. Negative Questions: questions that cause the child to lie, that can be answered by a yes or no, or that have obvious answers, e.g., "Do you like your teacher?"

2. Negative Advice: advice not preceded by understanding.

3. Negative Praise: praise that is global and not directed to a specific act; e.g., "You're just such a good boy."

4. Negative Comparison: comparison which attacks the personality; e.g., "Your brother never had a "D" in math."

5. Event-Feeling: a statement which shows a reaction to an event when a feeling should be reacted to; e.g., if the child says he was yelled at in school, a negative response would be, "You must have been bad."

6. Non-Sequitur: self-explanatory.

7. Negative Criticism: criticism not preceded by understanding.

8. Insults: self-explanatory.

9. Sarcasm: self-explanatory.

10. Prophesying: a statement which makes a due prediction; e.g., "If you keep rubbing your eyes, you will go blind."

11. Threats: "If you don't shut-up, you're going to get it when we get home."

12. Bribes: "If you are good, we'll stop at the store."

13. Dictates Feelings: statements which tell the child how to feel; e.g., "You should be happy."

14. Dictates Actions: statements which direct child's behavior; e.g., "Look at the man when you talk."

15. Denials: statements wherein the parent denies something without explanation; e.g., "Your father wasn't mad at you."

16. Aborts: statements which seemingly show acceptance but by their manner disrupt conversation; e.g., "That's very interesting, but now I want to tell you something."

17. Interruptions: self-explanatory.

18. Other: a residual category made available to place any negative statement that does not fit easily into any of the above negative categories.

V. CONCLUSIONS

A. Overview

The conclusions of this study are of two types. First there are specific conclusions--conclusions related to the goals of the project, the children studied, and the nature of the disorder under investigation. Second, there are general conclusions--conclusions related to a larger, more encompassing, problem area.

B. Specific Conclusions

The results of this study indicate that the use of parent-child interaction patterns in planning therapy for school-age stutterers is a strategy worthy of consideration. The observed interaction patterns suggest interpersonal behavior patterns for the therapist to adopt in therapy.

With most of the stuttering children in this study, the therapist adopted a manner that was opposite to that of the parent. By assuming this "mirror-image" role, increased fluency levels emerged in the majority of children.

It is important to note that with only two children were procedures utilized that focused on modifying the overt manifestations of stuttering (blocks, repetitions, and so on). Thus, increased fluency levels in the children were achieved incidentally by having the therapist create a new verbal enviornment for the child.

The therapeutic strategies developed in this study can be used in the public school setting. There is no need for expensive and elaborate equipment, nor is extensive retraining required for public school therapists. All that is required is minimal participation by the parent, and maximum sensitivity by the therapist to parent-child interaction patterns.

It is not necessarily recommended that public school therapists abandon completely their present techniques and methods for the procedures described in this report. It is recommended, however, that they consider this report and utilize the information that can be obtained from a parent-child session. Such information is relatively easy to obtain, and my make more vivid the details of this report. After viewing the interpersonal interactions between parents and their stuttering children, the public school therapist may decide to adopt the procedures presented herein, or integrate the information in another therapeutic procedure.

By ignoring parental behavior, the therapist eliminates two areas of information that may be crucial for treating the child: one area is related to diagnosis and treatment; the second, relates to generalization.

If the parent's behavior is believed to be a contributory factor in the maintenance of his child's stuttering, then parent-child interactions should be observed. Otherwise, the therapist may continue to engage in therapy that lasts for years and becomes aversive to both therapist and child. The most salient aspects of the problem are not taken into account.

The therapist who sees the child exclusively in therapy must rely on ancedotal reports in determining the generalization of his results. By including the parent in the treatment process at various times during the course of therapy, generalization may be observed first-hand, and in addition, the generalization process itself may be facilitated.

In this study, information about parental behavior was obtained by observing only one parent. In most cases, this was the mother. Mothers were more available time-wise. It would have been preferable to have both parents participating, or to have at least observed both parents in the evaluation session. It is recommended that those who utilize the procedures presented in this report attempt to observe both parents.

There are, of course, children who have no parents or who have parents unwilling or unable to participate in therapy. One such child was included in Stage II of this study. A peer was recruited to talk to the child in the CWS. In doing this, an assessment of the generalization of therapeutic results was possible. However, no parental maintenance factors could be identified. Because there were many common patterns in the stuttering parent's interaction behavior, one might assume, in the absence of any other information, that these patterns were existant in the backgrounds of the children without parents, and proceed in therapy using similar strategies. The findings reported in Section IV above would support this view.

C. General Conclusions

Recently, interest in family therapy has been growing. The results of this study would support this new emphasis. Additional research is needed to determine the range of parent-child interaction patterns. What patterns are "abnormal" and result in childhood disorders, and what patterns are "normal" and facilitate the psychological growth of the child. Such information may not only improve the treatment of handicpped children, but simultaneously may assist the parents as well.

The outcome can be rewarding. For example, Parent 9 (father said at the end of therapy:

> This (coming to therapy) did more for me than her. I learned to talk to my daughter. She was trying to talk to me but I wouldn't let her.

APPENDIX 1 RAW DATA FOR SUBJECT 1

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	1463	1614	209	384	14.29	23.79
2	2	687	1998	126	357	18.34	17.87
3	2	6190	8601	201	37	3.25	.43
4	2	740	1297	134	151	18.11	11.64
5	2	762	1173	132	111	17.32	9.46
6	2	797	1883	69	78	8.66	4.14
7	2	932	2232	135	162	14.48	7.26
8	2	918	1397	131	115	14.27	8.23
9	2	857	3260	126	166	14.70	5.09
10	2	1104	3627	149	180	13.50	4.96
11	2	834	3483	125	112	14.99	3.22
12	2	1247	4595	171	108	13.71	2.35
13	2	1299	4629	117	62	9.01	1.34
14	2	1174	4599	129	69	10.99	1.50
15	2	784	3352	134	194	17.09	5.79
16	2	1067	4458	114	112	10.68	2.51
17	2	1503	2353	125	19	8.32	.81
18	2	925	2773	107	35	11.57	1.26
19	2	596	1875	71	25	11.91	1.33
20	2	791	2859	115	18	14.54	.63
21	2	860	2303	196	26	22.79	1.13
22	2	771	2308	106	35	13.75	1.52
23	2	748	2600	134	27	17.91	1.04
24	2	1027	2542	114	23	11.10	.90
25	2	745	3091	77	24	10.34	.78
26	3	639	1687	73	31	11.42	1.84

APPENDIX 2 RAW DATA FOR SUBJECT 2

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	1398	1308	66	108	4.72	8.26
2	2	625	1988	34	118	5.44	5.94
3	2	782	1875	45	79	5.75	4.21
4	2	761	2039	41	79	5.39	3.87
5	2	1441	3272	38	89	2.64	2.72
6	2	1292	3467	72	41	5.57	1.18
7	2	1138	4073	63	105	5.54	2.58
8	2	609	3395	38	69	6.24	2.03
9	2	526	3024	25	61	4.75	2.02
10	2	704	2831	27	73	3.84	2.58
11	2	893	3285	42	76	4.70	2.31
12	2	1004	2661	52	91	5.18	3.42
13	2	422	1848	19	72	4.50	3.90
14	2	0	1849	0	57	.00	3.08
15	2	616	2159	39	57	6.33	2.64
16	2	340	1414	23	37	6.76	2.62
17	2	683	1786	32	31	4.69	1.74
18	2	662	1403	26	19	3.93	1.35
19	2	682	1187	30	30	4.40	2.53
20	2	803	1640	47	51	5.85	3.11
21	2	525	1196	19	15	3.62	1.25

APPENDIX 4 RAW DATA FOR SUBJECT 4

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	1240	1403	161	179	12.98	12.76
2	2	355	666	77	141	21.69	21.17
3	2	638	643	105	121	17.27	18.82
4	2	759	1290	148	171	19.50	13.26
5	2	695	1513	109	202	15.68	13.35
6	2	709	2019	124	168	17.49	8.32
7	2	518	2651	89	165	17.18	6.22
8	2	583	2092	82	150	14.07	7.17
9	2	769	3444	104	142	13.52	4.12
10	2	701	3054	128	83	18.26	2.72
11	2	570	3672	90	169	15.79	4.60
12	2	582	2153	133	88	22.85	4.09
13	2	710	1700	120	128	16.90	7.53
14	2	633	1471	93	97	14.69	6.59
15	2	421	1063	103	95	24.47	8.94
16	2	425	1101	76	82	17.88	7.45
17	2	379	1066	70	78	18.47	7.32
18	2	589	1521	38	153	6.45	10.06
19	2	346	637	49	102	14.16	16.01
20	2	452	2468	46	152	10.18	6.16
21	2	471	2555	35	193	7.43	7.55
22	2	476	2509	40	149	8.40	5.94

APPENDIX 3 RAW CATA FOR SUBJECT 3

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	2135	2427	56	60	2.62	2.47
2	2	914	2672	42	64	4.60	2.40
3	2	957	2368	37	28	3.87	1.18
4	2	1370	3052	24	27	1.75	.88
5	2	1194	4031	28	33	2.35	.82
6	2	1551	4868	29	22	1.87	.45
7	2	2534	5845	26	48	1.03	.82
8	2	1319	4878	51	59	3.87	1.21
9	2	1901	5338	54	34	2.84	.64
10	2	976	5891	19	25	1.95	.42
11	2	2557	7169	37	46	1.45	.64
12	2	1203	5795	17	26	1.41	.45
13	2	1445	5412	38	39	2.63	.72
14	2	1114	4772	23	53	2.06	1.11
15	2	1164	5187	48	69	4.12	1.33
16	2	973	2931	39	66	4.01	2.25
17	2	1271	3500	51	53	4.01	1.51
18	2	746	4649	52	47	6.97	1.01
19	2	1413	4455	44	60	3.11	1.35
20	2	1725	4077	96	190	5.57	4.66
21	2	1044	3588	128	35	12.26	.98
22	2	934	3625	36	51	3.85	1.41
23	3	906	3603	54	60	5.96	1.67
24	3	697	3107	35	74	5.02	2.38
25	3	1078	2638	64	68	5.94	2.58
26	3	788	2992	47	55	5.96	1.84
27	3	1139	3707	78	135	6.85	3.64
28	3	1082	2664	71	58	6.56	2.18
29	3	1145	2705	126	61	11.00	2.26

APPENDIX 5 RAW DATA FOR SUBJECT 5

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	1647	2381	88	162	5.34	6.80
2	2	1117	2176	71	133	6.36	6.11
3	2	998	2401	59	59	5.91	2.46
4	2	1213	3827	46	73	3.79	1.91
5	2	1747	5287	52	76	2.98	1.44
6	2	957	6552	30	70	3.13	1.07
7	2	1591	6242	61	82	3.83	1.31
8	2	1674	4939	65	90	3.88	1.82
9	2	1275	5405	42	85	3.29	1.57
10	2	1396	3418	46	51	3.30	1.49
11	2	1023	3372	38	58	3.71	1.72
12	2	1075	3485	34	60	3.16	1.72
13	2	1012	3427	44	60	4.35	1.75
14	2	993	2951	30	109	3.02	3.69
15	2	1321	2809	75	82	5.68	2.92
16	2	1062	3457	42	61	3.95	1.76
17	3	1127	3280	46	127	4.08	3.87
18	3	1373	5038	132	285	9.61	5.66
19	4	790	374	33	14	4.18	3.74

APPENDIX 6 RAW DATA FOR SUBJECT 6

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	2164	3460	81	156	3.74	4.51
2	2	849	2314	45	114	5.30	4.93
3	2	1195	2535	44	63	3.68	2.49
4	2	1334	3119	42	60	3.15	1.92
5	2	1165	3289	31	54	2.66	1.64
6	2	1410	4581	53	100	3.76	2.18
7	2	3199	4230	119	85	3.72	2.01
8	2	956	3940	53	135	5.54	3.43
9	2	1355	4136	82	91	6.05	2.20
10	2	1751	4796	103	177	5.88	3.69
11	2	1301	4329	50	121	3.84	2.80
12	2	1200	4137	48	118	4.00	2.85
13	2	889	2700	66	241	7.42	8.93
14	2	1036	2046	47	73	4.54	3.57
15	2	518	1773	59	135	11.39	7.61
16	2	1248	3280	72	78	5.77	2.38
17	2	0	3153	0	46	.00	1.46
18	2	1330	2165	49	31	3.68	1.43
19	2	1013	2444	48	35	4.74	1.43
20	2	0	2504	0	33	.00	1.32
21	2	809	2539	16	22	1.98	.87
22	2	0	2650	0	53	.00	2.00
23	2	0	3397	0	82	.00	2.41
24	2	0	3130	0	83	.00	2.65
25	2	1163	2540	86	325	7.39	12.80
26	2	1056	2274	71	97	6.72	4.27
27	2	978	2383	53	63	5.42	2.64
28	2	1078	4262	48	155	4.45	3.64
29	2	1274	5449	12	38	.94	.70
30	2	2773	3365	21	16	.76	.48

APPENDIX 7 RAW DATA FOR SUBJECT 7

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	1242	1952	149	100	12.00	5.12
2	2	1299	2028	114	137	8.78	6.76
3	2	1005	1804	88	93	8.76	5.16
4	2	828	3002	73	109	8.82	3.63
5	2	817	1611	49	41	6.00	2.55
6	2	1151	3024	65	68	5.65	2.25
7	2	1436	3343	80	60	5.57	1.79
8	2	803	6303	182	68	22.67	1.08
9	2	846	5527	75	149	8.87	2.70
10	2	1221	4060	77	71	6.31	1.75
11	2	701	1885	64	47	9.13	2.49
12	2	587	4643	51	112	8.69	2.41
13	2	518	4608	31	137	5.98	2.97
14	2	382	2935	42	51	10.99	1.74
15	2	1026	2215	50	18	4.87	.81
16	2	366	2652	16	23	4.37	.87
17	2	678	2209	43	26	6.34	1.18
18	2	736	2557	44	46	5.98	1.80
19	2	730	1984	52	33	7.12	1.66
20	2	817	1225	51	38	6.24	3.10
21	2	606	713	57	46	9.41	6.45
22	2	1085	2107	84	36	7.74	1.71
23	3	364	2280	41	121	11.26	5.31
24	3	1120	2370	90	129	8.04	5.44
25	3	908	2239	77	139	8.48	6.21
26	3	1126	2309	92	124	8.17	5.37
27	3	903	1695	88	26	9.75	1.53
28	3	931	2627	31	60	3.33	2.28
29	4	891	1412	27	39	3.03	2.76

APPENDIX 8 RAW DATA FOR SUBJECT 8

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	2153	3189	82	138	3.81	4.33
2	2	608	2640	31	89	5.10	3.37
3	2	1275	3767	30	68	2.35	1.81
4	2	924	3724	46	105	4.98	2.82
5	2	1194	4253	59	74	4.94	1.74
6	2	1562	3822	86	85	5.51	2.22
7	2	1047	2766	41	50	3.92	1.81
8	2	1030	3295	70	78	6.80	2.37
9	2	1155	4428	49	99	4.24	2.24
10	2	614	2106	44	45	7.17	2.14
11	2	632	2059	35	31	5.54	1.51
12	2	730	2528	23	34	3.15	1.34
13	2	782	2394	37	68	4.73	2.84

APPENDIX 9 RAW DATA FOR SUBJECT 9

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	2247	4685	47	88	2.09	1.88
2	2	1434	2653	30	40	2.09	1.51
3	2	1127	3667	27	64	2.40	1.75
4	2	1141	3152	29	77	2.54	2.44
5	2	1137	2689	45	47	3.96	1.75
6	2	1422	3556	33	29	2.32	.82
7	2	1349	5492	60	59	4.45	1.07
8	2	1337	4132	30	36	2.24	.87
9	2	968	3792	31	54	3.20	1.42
10	2	939	3682	23	40	2.45	1.09
11	2	1770	4499	68	108	3.84	2.40
12	2	963	3426	27	37	2.80	1.08
13	2	1498	4187	38	38	2.54	.91
14	2	1330	5666	26	53	1.95	.94
15	3	558	4235	13	109	2.33	2.57
16	3	674	2552	21	49	3.12	1.92
17	3	555	3710	14	46	2.52	1.24
18	3	1037	3224	21	40	2.03	1.24
19	3	760	4285	12	59	1.58	1.38
20	4	993	1623	0	0	.00	.00

APPENDIX 10 RAW DATA FOR SUBJECT 10

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	423	3020	4	71	.95	2.35
2	2	690	7651	5	5	.72	.07
3	2	782	3859	16	15	2.05	.39
4	2	975	3890	37	43	3.79	1.11
5	2	745	4536	14	23	1.88	.51
6	2	1051	4742	7	15	.67	.32
7	2	828	2522	7	5	.85	.20
8	2	635	2467	6	15	.94	.61
9	2	853	1331	6	18	.70	1.35
10	2	417	1319	16	5	3.84	.38
11	2	817	2049	10	18	1.22	.88
12	2	777	1993	18	19	2.32	.95
13	2	598	1651	6	10	1.00	.61
14	3	754	1512	2	5	.27	.33
15	3	721	1833	4	36	.55	1.96
16	3	693	1414	2	9	.29	.64
17	3	713	1369	6	4	.84	.29
18	3	373	1296	6	14	1.61	1.08

APPENDIX 11 RAW DATA FOR SUBJECT 11

SESSION NO.	TYPE SESSION	WORDS UTTERED		STUTTERING FREQUENCY		PERCENT OF WORDS STUTTERED	
		CWS	TS	CWS	TS	CWS	TS
1	1	609	2039	126	341	20.69	16.72
2	2	1031	1740	175	652	16.97	37.47
3	2	1252	3410	271	660	21.65	19.35
4	2	1002	2978	279	398	27.84	13.36
5	2	924	2898	163	329	17.64	11.35
6	2	658	3323	153	392	23.25	11.80
7	2	1067	1859	216	237	20.24	12.75
8	2	987	2447	192	272	19.45	11.12
9	2	681	2872	146	189	21.44	6.58
10	2	1131	2362	233	139	20.60	5.88
11	2	1175	2578	142	117	12.09	4.54
12	2	1215	2842	217	220	17.86	7.74
13	2	1022	2883	143	112	13.99	3.88
14	2	1060	2736	196	218	18.49	7.97
15	2	1094	2388	209	286	19.10	11.98
16	2	877	0	170	0	19.38	.00
17	2	1185	0	250	0	21.10	.00
18	2	878	1162	111	128	12.64	11.02
19	2	734	2114	117	216	15.94	10.22
20	2	800	1818	128	156	16.00	8.58
21	2	579	1580	85	203	14.68	12.85
22	2	951	1935	114	176	11.99	9.10
23	2	1003	1228	188	119	18.74	9.69
24	2	802	1776	86	275	10.72	15.48
25	2	1432	2747	199	167	13.90	6.08
26	2	955	2200	115	152	12.04	6.91
27	2	1026	2813	145	128	14.13	4.55
28	2	928	2095	137	182	14.76	8.69
29	2	1028	1939	151	147	14.69	7.58
30	2	745	2042	133	239	17.85	11.70

APPENDIX 12 RAW CATA FOR SUBJECT 13

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	336	1461	26	161	7.74	11.02
2	2	328	1285	41	122	12.50	9.49
3	2	347	674	41	126	11.82	18.69
4	2	448	157	41	18	9.15	11.46
5	2	301	1119	60	136	19.93	12.15
6	2	493	1417	30	40	6.09	2.82
7	2	145	1152	14	119	9.66	10.33
8	2	378	1151	40	195	10.58	16.94
9	2	232	933	17	113	7.33	12.11
10	2	546	1583	38	127	6.96	8.02
11	2	507	1131	9	17	1.78	1.50
12	2	526	839	16	14	3.04	1.67

APPENDIX 13 RAW DATA FOR SUBJECT 14

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	626	2005	39	77	6.23	3.84
2	2	633	2154	29	54	4.58	2.51
3	2	677	1862	38	44	5.61	2.36
4	2	712	2219	13	15	1.83	.68
5	2	536	1077	12	11	2.24	1.02
6	2	872	1046	16	4	1.83	.38
7	2	728	1505	13	10	1.79	.66

APPENDIX 14 RAW DATA FOR SUBJECT 16

SESSION NO.	TYPE SESSION	WORDS UTTERED		STUTTERING FREQUENCY		PERCENT OF WORDS STUTTERED	
		CWS	TS	CWS	TS	CWS	TS
1	1	592	1931	16	32	2.70	1.66
2	2	1070	1330	56	22	5.23	1.65
3	2	468	1077	48	19	10.26	1.76
4	2	943	1844	21	12	2.23	.65
5	2	1124	1546	20	1	1.78	.06
6	2	999	1068	13	6	1.30	.56
7	2	891	1444	5	8	.56	.55
8	2	551	0	2	0	.36	.00
9	2	531	0	2	0	.38	.00
10	2	331	1510	1	1	.30	.07
11	2	0	1646	0	2	.00	.12
12	2	1131	1272	0	0	.00	.00
13	2	0	984	0	0	.00	.00
14	2	0	1286	0	1	.00	.08
15	2	454	1074	1	0	.22	.00
16	2	0	1586	0	1	.00	.06
17	2	0	923	0	4	.00	.43
18	2	0	973	0	2	.00	.21
19	2	757	799	2	0	.26	.00
20	2	0	1632	0	0	.00	.00
21	2	833	854	1	0	.12	.00

APPENDIX 15 RAW DATA FOR SUBJECT 17

SESSION NO.	TYPE SESSION	WORDS UTTERED		STUTTERING FREQUENCY		PERCENT OF WORDS STUTTERED	
		CWS	TS	CWS	TS	CWS	TS
1	1	973	1740	19	35	1.95	2.01
2	2	0	830	0	90	.00	10.84
3	2	0	1467	0	67	.00	4.57
4	2	0	797	0	14	.00	1.76
5	2	0	394	0	5	.00	1.27
6	2	0	667	0	5	.00	.75
7	2	0	1231	0	11	.00	.89
8	2	0	540	0	13	.00	2.41
9	2	0	475	0	14	.00	2.95
10	2	0	688	0	4	.00	.58
11	2	0	886	0	66	.00	7.45
12	2	0	933	0	5	.00	.54

APPENDIX 16 RAW DATA FOR SUBJECT 18

SESSION NO.	TYPE SESSION	WORDS UTTERED		STUTTERING FREQUENCY		PERCENT OF WORDS STUTTERED	
		CWS	TS	CWS	TS	CWS	TS
1	1	492	1868	35	150	7.11	8.03
2	2	678	966	100	73	14.75	7.56
3	2	806	2334	33	97	4.09	4.16
4	2	1175	1045	96	33	8.17	3.16
5	2	1136	1446	113	68	9.95	4.70
6	2	1002	1363	70	68	6.99	4.99
7	2	1144	1332	101	22	8.83	1.65
8	2	1010	914	40	12	3.96	1.31
9	2	1180	1216	51	15	4.32	1.23
10	2	1063	1435	37	8	3.48	.56
11	2	0	1353	0	6	.00	.44
12	2	1159	926	57	5	4.92	.54
13	2	1358	605	36	3	2.65	.50
14	2	0	1747	0	35	.00	2.00
15	2	0	1044	0	13	.00	1.25
16	2	1342	1055	13	5	.97	.47
17	2	0	1465	0	5	.00	.34
18	2	1343	672	10	0	.74	.00
19	2	0	1537	0	4	.00	.26
20	2	1246	1341	8	3	.64	.22

APPENDIX 17 RAW DATA FOR SUBJECT 19

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	728	0	24	0	3.30	.00
2	2	874	966	17	20	1.95	2.07
3	2	564	0	18	0	3.19	.00
4	2	0	1404	0	28	.00	1.99
5	2	709	0	20	0	2.82	.00
6	2	647	1403	28	21	4.33	1.50
7	2	0	1106	0	8	.00	.72
8	2	935	629	5	3	.53	.48
9	2	0	1139	0	0	.00	.00
10	2	1563	991	5	3	.32	.30
11	2	0	1461	0	8	.00	.55
12	2	638	724	3	5	.47	.69
13	2	0	1093	0	5	.00	.46
14	2	984	1074	5	6	.51	.56
15	2	0	1436	0	9	.00	.63
16	2	0	1240	0	9	.00	.73
17	2	0	1328	0	9	.00	.68
18	2	0	1224	0	4	.00	.33
19	2	0	1543	0	2	.00	.13
20	2	0	1032	0	2	.00	.19
21	2	0	1244	0	3	.00	.24

APPENDIX 18 RAW DATA FOR SUBJECT 21

SESSION NO.	TYPE SESSION	WORDS UTTERED		STUTTERING FREQUENCY		PERCENT OF WORDS STUTTERED	
		CWS	TS	CWS	TS	CWS	TS
1	1	1186	0	56	0	4.72	.00
2	2	0	1654	0	46	.00	2.78
3	2	780	1306	30	31	3.85	2.37
4	2	0	403	0	6	.00	1.49
5	2	0	223	0	3	.00	1.35
6	2	561	341	4	5	.71	1.47
7	2	0	340	0	4	.00	1.18
8	2	571	495	8	10	1.40	2.02
9	2	0	1016	0	4	.00	.39
10	2	0	916	0	6	.00	.66
11	2	443	412	1	3	.23	.73
12	2	0	1659	0	3	.00	.18
13	2	0	1521	0	4	.00	.26
14	2	0	1106	0	6	.00	.54
15	2	574	842	2	3	.35	.36

APPENDIX 19 RAW DATA FOR SUBJECT 22

SESSION NO.	TYPE SESSION	WORDS UTTERED		STUTTERING FREQUENCY		PERCENT OF WORDS STUTTERED	
		CWS	TS	CWS	TS	CWS	TS
1	1	1341	0	46	0	3.43	.00
2	2	0	1609	0	75	.00	4.66
3	2	780	1578	24	48	3.08	3.04
4	2	0	1271	0	21	.00	1.65
5	2	0	1317	0	38	.00	2.89
6	2	0	2085	0	33	.00	1.58
7	2	379	1673	12	38	3.17	2.27
8	2	398	1704	12	18	3.02	1.06
9	2	0	1893	0	18	.00	.95
10	2	668	844	2	23	.30	2.73
11	2	0	427	0	17	.00	3.98
12	2	0	1674	0	20	.00	1.19
13	2	552	836	6	10	1.09	1.20

APPENDIX 20 RAW DATA FOR SUBJECT 23

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	841	0	33	0	3.92	.00
2	2	0	1604	0	30	.00	1.87
3	2	0	1338	0	50	.00	3.74
4	2	521	1295	5	2	.96	.15
5	2	780	823	8	8	1.03	.97
6	2	0	778	0	18	.00	2.31
7	2	0	902	0	19	.00	2.11
8	2	244	534	1	11	.41	2.06
9	2	462	568	1	4	.22	.70
10	2	0	1216	0	18	.00	1.48
11	2	544	842	4	10	.74	1.19
12	2	670	985	5	10	.75	1.02
13	2	0	890	0	9	.00	1.01
14	2	496	876	6	10	1.21	1.14

APPENDIX 21 RAW DATA FOR SUBJECT 24

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	936	1575	72	135	7.69	8.57
2	2	483	1465	60	116	12.42	7.92
3	2	302	1368	35	87	11.59	6.36
4	2	367	1682	26	80	7.08	4.76
5	2	406	0	29	0	7.14	.00
6	2	0	581	0	13	.00	2.24
7	2	0	1428	0	79	.00	5.53
8	2	0	2 [illegible]	0	46	.00	2.17
9	2	647	2094	53	39	8.19	1.86
10	2	0	1804	0	16	.00	.89
11	2	411	0	24	0	5.84	.00
12	2	0	1544	0	23	.00	1.49
13	2	0	1336	0	9	.00	.67
14	2	0	1563	0	6	.00	.38
15	2	0	1698	0	9	.00	.53
16	2	0	1541	0	7	.00	.45

APPENDIX 22 RAW DATA FOR SUBJECT 25

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	921	0	42	0	4.56	.00
2	2	0	1074	0	54	.00	5.03
3	2	530	1398	9	18	1.70	1.29
4	2	0	823	0	8	.00	.97
5	2	0	512	0	7	.00	1.37
6	2	0	893	0	12	.00	1.34
7	2	338	582	3	3	.89	.52
8	2	567	701	6	10	1.06	1.43
9	2	0	680	0	2	.00	.29
10	2	750	901	12	11	1.60	1.22
11	2	650	890	8	10	1.23	1.12
12	2	0	864	0	10	.00	1.16
13	2	513	1034	7	12	1.36	1.16

APPENDIX 23 RAW DATA FOR SUBJECT 27

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	442	365	71	45	16.06	12.33
2	2	361	272	64	27	17.73	9.93
3	2	312	247	45	24	14.42	9.72
4	2	332	186	65	15	19.58	8.06
5	2	324	292	63	32	19.44	10.96
6	2	331	639	92	50	27.79	7.82
7	2	365	470	60	43	16.44	9.15
8	2	0	322	0	61	.00	18.94
9	2	0	828	0	31	.00	3.74
10	2	0	781	0	28	.00	3.59
11	2	0	683	0	22	.00	3.22
12	2	485	753	30	21	6.19	2.79
13	2	529	608	29	21	5.48	3.45

APPENDIX 24 RAW DATA FOR SUBJECT 28

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	364	484	63	45	17.31	9.30
2	2	300	498	25	21	8.33	4.22
3	2	390	819	42	18	10.77	2.20
4	2	556	504	62	13	11.15	2.58
5	2	544	617	29	14	5.33	2.27
6	2	0	426	0	8	.00	1.88
7	2	432	1030	30	27	6.94	2.62
8	2	763	1020	60	34	7.86	3.33
9	2	0	826	0	28	.00	3.39
10	2	0	951	0	16	.00	1.68
11	2	0	775	0	9	.00	1.16
12	2	610	863	23	15	3.77	1.74
13	2	528	611	24	10	4.55	1.64

APPENDIX 25 RAW DATA FOR SUBJECT 29

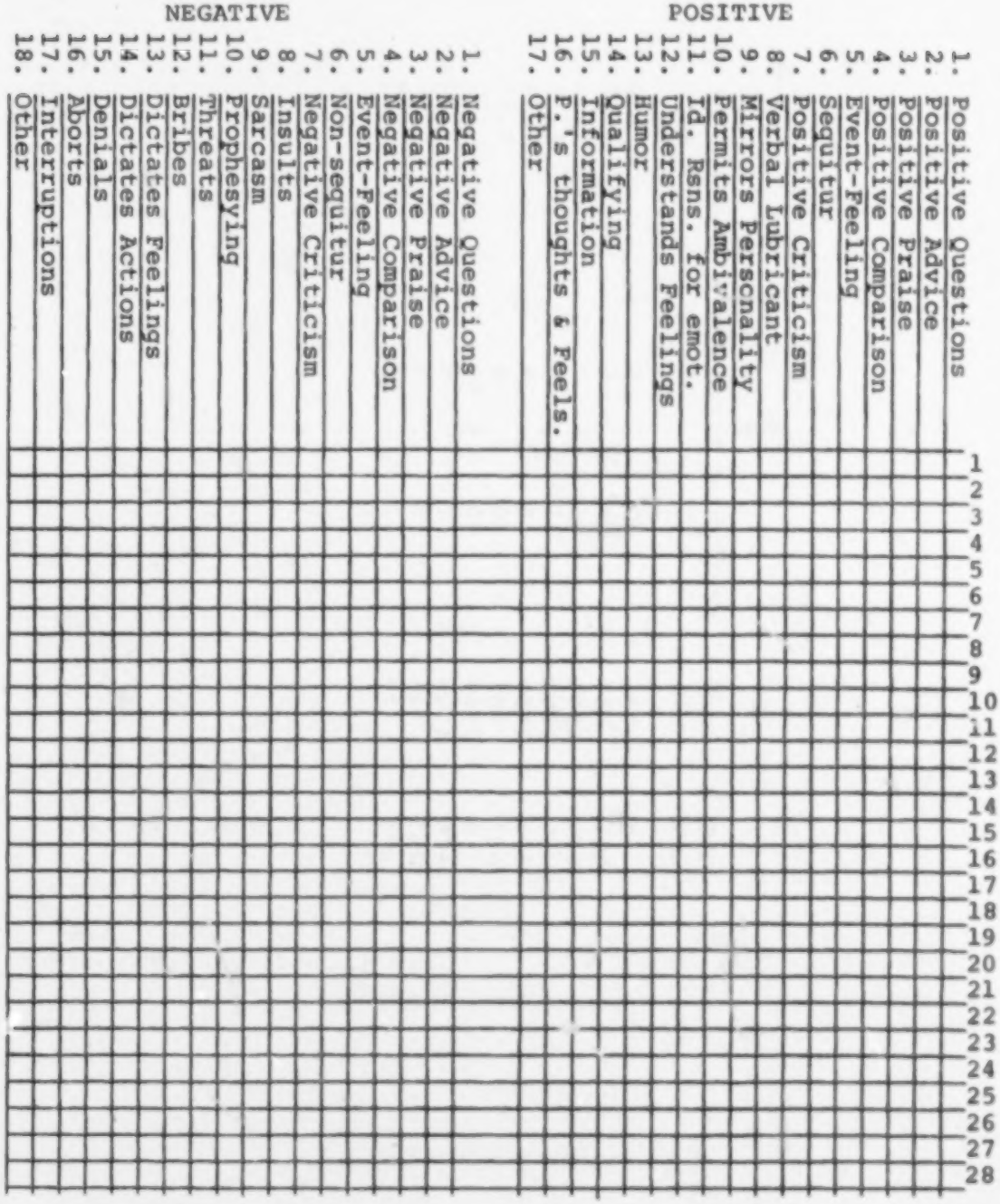
SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	0	1076	0	58	.00	5.39
2	2	418	580	11	17	2.63	2.93
3	2	564	752	16	56	2.84	7.45
4	2	0	1636	0	81	.00	4.95
5	2	572	1384	16	65	2.80	4.70
6	2	0	715	0	24	.00	3.36
7	2	805	670	10	22	1.24	3.28
8	2	0	1339	0	55	.00	4.11
9	2	637	1546	12	31	1.88	2.01
10	2	0	1072	0	15	.00	1.40
11	2	684	697	9	8	1.32	1.15
12	2	677	721	8	8	1.18	1.11

APPENDIX 26 RAW DATA FOR SUBJECT 30

SESSION NO.	TYPE SESSION	WORDS UTTERED CWS	WORDS UTTERED TS	STUTTERING FREQUENCY CWS	STUTTERING FREQUENCY TS	PERCENT OF WORDS STUTTERED CWS	PERCENT OF WORDS STUTTERED TS
1	1	0	1331	0	28	.00	2.10
2	2	507	335	10	4	1.97	1.19
3	2	619	443	11	6	1.78	1.35
4	2	789	1361	11	16	1.39	1.18
5	2	597	1359	8	14	1.34	1.03
6	2	607	888	10	10	1.65	1.13
7	2	0	1369	0	46	.00	3.36
8	2	678	1594	7	48	1.03	3.01
9	2	743	614	3	2	.40	.33
10	2	693	754	2	4	.29	.53

APPENDIX 27. Parent-child interaction analysis form.

I.D. #_____
NAME:_____
Date _____
Session #_____
Page_____ of _____



APPENDIX 28

COPY

June 16, 1970

Father Aaron
Assistant Superintendent of Schools
Catholic Diocese of Pittsburgh
111 Boulevard of the Allies
Pittsburgh, Pennsylvania 15222

Dear Father Aaron:

The purpose of this letter is to expand certain proposals I discussed with you on the phone on June 3, 1970. In that conversation, I mentioned to you that we were interested in testing certain remedial procedures that we have developed for the treatment of children who stutter. I inquired about the possibility of doing such testing within your school system. The arrangement would be, I think, of mutual benefit to both of us since we would be obtaining valuable information on our program, and you would have, without charge, the full time services of a speech pathologist.

The remedial program that we are testing is the result of a study sponsored by the U. S. Office of Education. This study was designed to be run in two stages.

The first stage, the development stage, is complete. In Stage I, we designed a treatment program for children who stutter. We tested the program in the laboratory on 12 children with very encouraging results. A salient feature of our program is that the parent is an active participant in the therapeutic process. This means that at the successful completion of our program, the child not only is fluent with the speech therapist but can demonstrate and maintain this fluency with his parent, and reportedly with his peers and others to whom he speaks.

We are now ready to begin the second stage of this study, the application stage, which involves the testing of this program in the schools. It is here that we inquire about your interest in cooperating with us. Basically, we would be running the same program, but in a school setting. In such a setting, we could have first hand knowledge about the general utility of our laboratory procedures and could assess the effect of treatment on classroom performance. It is important, I think, to keep in mind that we would not be groping blindly, but would be entering your school system with designed and tested procedures.

APPENDIX 28

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As to administrative details, we could make available a full-time speech therapist from September 1, 1970, to May 1, 1971. This therapist would be interested primarily in the treatment of children who stutter. We in no way want to give the impression that we are replacing any of your current staff, but would hope instead, that the experience would be professionally rewarding for both your people and us.

As you consider this proposal, please feel free to call me at any time. I can be reached at 621-3500, extension 309.

Thank you for your considerations.

Sincerely,

Donald B. Egolf, Ph.D.
Project Director/Ass't.
Professor of Speech

DBE:ys

Catholic School Board

Diocese of Pittsburgh

Most Reverend
John B. McDowell D.D., Ph.D.
Superintendent

Mr. John J. Cicco, M. Ed.
Deputy Superintendent

Reverend James L. Aaron, M. Ed.
Assistant Superintendent

111 BOULEVARD OF THE ALLIES
PITTSBURGH, PENNSYLVANIA, 15222

Telephone
(412) 391-1002

APPENDIX 29

July 23, 1970

COPY

Donald B. Egolf, Ph.D.
1104 Cathedral of Learning
University of Pittsburgh
Pittsburgh, Pennsylvania 15213

Dear Dr. Egolf:

This will confirm our willingness to participate in the application of the treatment program for children who stutter.

It is my understanding that a speech therapist will be available to apply the treatment program in two or three of our schools, depending on the size and location. This therapist will work exclusively with children who can be treated according to the procedures and programs developed in the earlier stage of your study.

Unfortunately, our principals are not readily available at this time of the summer, and I am unable to name the participating schools at this time. As soon as possible, I shall contact you.

Sincerely yours,

James L. Aaron

Reverend James L. Aaron
Assistant Superintendent

JLA:vf

FACULTY OF ARTS AND SCIENCES
UNIVERSITY OF PITTSBURGH
PITTSBURGH, PENNSYLVANIA 15213

DEPARTMENT OF SPEECH AND THEATRE ARTS

May 27, 1971

COPY

APPENDIX 30

Reverend James L. Aaron
Assistant Superintendent
Catholic School Board
Diocese of Pittsburgh
111 Boulevard of the Allies
Pittsburgh, Pennsylvania 15222

Dear Father Aaron:

Enclosed please find a summary report describing the speech-therapy study that we conducted in your school. As the report reveals, our results were generally favorable.

It has been suggested that we publish the results of our study. In that regard, I must ask you if you would have any reservation against our acknowledging, in the manuscript, the cooperation of you, your colleagues, and the Diocese. Please advise me, in writing, on this matter.

In thanking them for their assistance, I asked the principals of the schools that we visited to comment on the study. Of the reports received, all seemed favorable.

I would now like to thank you for your generous assistance in conducting this study. As I mentioned to you before, cooperative efforts are most productive when there is mutual reward. We have been quite satisfied, and hope that the increased fluency observed in the children will be maintained, thus creating mutual satisfaction.

Thank you again.

Sincerely

Donald B. Egolf, Ph.D.
Assistant Professor
of Speech

DBE:ys

Enclosure

CATHOLIC SCHOOL BOARD Diocese of Pittsburgh

111 Boulevard of the Allies Pittsburgh, Pennsylvania 15222 (412) 391 - 1002

Superintendent
Mr. John T. Cicco

Assistant Superintendents
Rev. James L. Aaron
Rev. Richard L. Conboy
Sr. Colette Link, H. M.

APPENDIX 31

COPY

June 7, 1971

Donald B. Egolf, Ph.D.
Assistant Professor of Speech
Faculty of Arts and Sciences
University of Pittsburgh
Pittsburgh, Pennsylvania 15213

Dear Dr. Egolf:

Thank you for your letter of May 27, 1971 and your report of the Speech Therapy Study conducted in seven of the schools of the Diocese of Pittsburgh. I am happy to hear that the demonstration appears to be favorable and that some children have been helped.

As far as this office is concerned, there would be no objection to your publishing the results of the study. I would presume that you would respect the confidentiality of the situation, and preserve the anonymity of the families involved.

Thank you for making the service available to the children in our schools. If there are any future prospects of projects of this kind, I am sure you will find a receptive ear here.

Sincerely yours,

James L. Aaron

Reverend James L. Aaron
Assistant Superintendent

JLA:vf

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